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Colovesical fistula complicating diverticular disease: diagnosis and surgical management in elderly

Colovesical fistula (CVF) is pathological communication between the bladder and the large intestine, usually the sigmoid colon.

The common cause of CVF is represented by diverticular disease (DD, 40-88%), but can also be found in other pathological conditions such as colon cancer (19%) and Crohn's disease (5%). The incidence of CVF in DD has been estimated to be about 2% to 4%, although a wide range between 2% and 23% has been reported. More rarely, it may be due to bladder or uterine cancers, radiotherapy treatments, or even iatrogenic lesions or penetrating traumas.

There are also rare cases of CVF in patients with non-Hodgkin lymphoma with AIDS and after laparoscopic inguinal hernia repair. Other different types of fistula can be seen in DD, colovaginal (20%), followed by colcutaneous, ileovesical (16%) and rectovesical (11%).

In our study, the commonest underlying etiologies of CVF were colonic diverticulosis: a finding that is concordant with previously published literature. The pathogenesis involves direct extension of a ruptured diverticulum or erosion of a peridiverticular abscess into the bladder. They are more common in elderly males and in women who have previously undergone hysterectomy (M/F=5:1). These observations support the theory that the body and fundus of the uterus may act as a protective barrier in women. In our series the ratio male/female in CVF is 3/1 with a predominance in male, and the female patient had a history of hysterectomy with radiation therapy for uterine malignancy.

According to our study, the typical signs of CVF are pneumaturia (bubbles of air in the urine) and fecaluria. The first signs and symptoms in CVF can also be represented by UTI, dysuria, pollakiuria, hematuria making it more difficult and tardive the diagnosis.^{1,2}

The diagnosis of CVF is primarily clinical and instrumental examinations should be directed to detecting the causes of fistula.

Radiological identification of a CVF tract can be difficult. The CVF tract is identified with barium enema in

44% of cases as reported in the literature. As evidenced in our study, barium enema alone cannot show the eventual presence of malignant elements in CVF.

Cystoscopy is the most appropriate test to highlight the presence of a fistula opening in the bladder.

In our study, colonoscopy was often used to examine inflammation of the mucosa, to exclude Crohn's disease and the presence of mucosal lesions and malignancy.

CT is the preferred diagnostic imaging modality owing to its high sensitivity (over 90%). Fistulas may be demonstrated by gas or contrast in the bladder, or local colonic and bladder wall thickening. CT is used to plan surgery by evaluating the degree of pelvic inflammation, the existence of pericolic abscesses and the detection of a malignancy of the colon or bladder. In our cases, we verified ultrasound to be helpful in the assessment of complicated DD, but not in the evaluation of CVF.

Magnetic resonance imaging (MRI) is highly sensitive but expensive and less accessible.

The surgical management of DD has evolved but still remains governed by clinical classification, namely, recurrent uncomplicated disease *versus* complicated disease.³

Surgery intervention consists in the removal of the diseased segment of the colon, as well as of the fistula, with primary suture of the bladder defect, and this essential to prevent recurrence and achieve best results. Initially, the surgical approach involved open resection in a two- or three- stage procedure, before trends shifted toward a single-stage procedure with primary anastomosis. The former is still recommended for perforated diverticulitis with fecal peritonitis, or purulent peritonitis where intraoperative conditions are unfavorable for primary anastomosis.⁴

The role of laparoscopic resection in complicated diverticulitis was initially controversial, colovesical fistulas are still considered a contraindication and have been identified as a risk factor for conversion and increased morbidity. However, many studies of laparoscopic resection for complicated diverticulitis have included colovesical fistulas and demonstrated acceptable results. Not surprising, studies found longer operating times and higher risk of conversion with associated morbidity. However, with increased laparoscopic experience, refinement in technique, and advances in surgical technology, the indications broadened.

Recent studies of laparoscopic management of complicated diverticulitis have demonstrated that in capable hands, operating times and conversion rates are acceptable, and morbidity and mortality rates are comparable with open surgery.⁵

There is limited consensus over management of the bladder in CVF repair. Various techniques have been

described including: the “pinch off” technique followed by simple; use of an omental patch to close the bladder defect; or wedge resection of the affected bladder area with closure using sutures or an omental patch. Simple decompression with an indwelling catheter alone may be sufficient for small defects. However, the bladder has to be drained with a Foley catheter for 7-10 post-operative days.

We have recently treated four cases of colovesical fistula. In an urgency setting for complicated diverticulitis in Hinchey III (one case), patient underwent to two-stage open surgery, primary anastomosis with loop ileostomy. In the remaining cases, patients underwent to single stage surgery (laparoscopic), with primary anastomosis.

In conclusion, in our series, CT was the most sensitive and accurate exam to diagnose CVF in the cases. Then, we suggest CT as a first line investigation in all patients with suspected CVF. CT detected air within the bladder earlier and without equivocation when compared with other imaging techniques. It is useful in the evaluation of pericolonic inflammation, thus performing an important role in surgical planning. Since 10% to 15% of CVF are due to malignancies, we recommend colonoscopy following the CT.

Our outcomes were comparable with those reported for laparoscopic management of CVF and complicated DD, laparoscopic resection and primary anastomosis should be considered a safe and feasible option.

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